

Please Join Us

NPSMA Workshop
Hosted by Worcester Polytechnic Institute
May 28-29, 2013
“PSM Opportunities in Data Sciences”
Worcester, Massachusetts



Save the Date

November 13-15, 2013
NPSMA 4th National Conference
“High Impact Partnerships: Building on 15 Years
of Innovative Professional Science Master's Education”
Pre-conference Workshop
“PSM Opportunities in Cybersecurity”
Arlington, Virginia

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NPSMA President David King Outlines 2013 Goals

First, I would like to express my appreciation for the support of the NPSMA Board of Directors in selecting me for the Presidency of the organization for 2013. This is a great honor and I look forward to a productive and collaborative year as we move ahead with work of this organization as a national leader of the PSM movement.



I also want to thank Bogdan Vernescu for his second tenure as President in 2012. He has been a visionary leader of the NPSMA since its inception and certainly has provided us with stability and continuity over the past five years. The other members of the Executive Committee deserve thanks for their tireless contributions. We should also recognize the service of the outgoing members of the Board (Dagmar Beck and Joseph Whittaker) and the commitment of the new members of the Board of Directors (David Dyer, Joan Huber, Sheila Thomas, and Marilyn Wells).

Special thanks to those who serve on our National Advisory Board, and to outgoing member, John Baldoni, and new

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KGI Rebate Program for NPSMA Memberships

The Alfred P. Sloan Foundation has recently awarded the PSM Office at the Keck Graduate Institute funding for a rebate program that provides membership dues rebates for **new** institutional members of the National Professional Science Master's Association. This rebate program is not dependent upon your application for PSM affiliation with the PSM office at KGI.

If your university would like to take advantage of the rebate program between now and October 31, 2013, you will be reimbursed 75% of the NPSMA membership fee. The rebate program works as follows:

- University joins the NPSMA for one year (\$2,000).
- University completes rebate form and W9 to send to KGI along with NPSMA membership receipt.
- KGI reimburses the university 75% of membership fee.

Download the rebate form and W9 [here](#). Join the NPSMA [here](#) or print the form on the last page of this newsletter.

If you would like a NPSMA membership invoice to be sent to you, or you think we should contact another member of your university's administration, please contact Debra Warren-Hite at admin@npsma.org.

Goals for 2013 (continued from page 1)

member, David Blockstein. Your input into the strategies that guide the work of the NPSMA is essential to our mission.

We hope to engage broad member participation in the work of the NPSMA. I encourage members to consider serving on the Marketing or Cybersecurity Workshop Committees. Please contact Debra Warren-Hite in the [NPSMA office](#).

In terms of my goals for the NPSMA in 2013, I would emphasize the following:

- Utilize the KGI/NPSMA rebate grant from the Sloan Foundation to encourage more institutional and PSM system memberships in NPSMA
- Plan exciting and productive workshops in May and November, as well as a very successful annual conference in November
- Promote the tracking of PSM graduates started by Sheila Tobias and Susan Richards
- Support and expand the PSM alumni chapters launched by Michael Morad and David Jay
- Enhance collaboration among the national leaders of the PSM movement including NPSMA, the KGI/PSM Office, the University Systems' PSM Consortium, the Sloan Conference Call Group, etc.
- Coordinate and foster advocacy for the PSM at the national, state and regional level
- Publicize and celebrate major milestone events and press releases to celebrate the 15th anniversary of the PSM and the launch of the 300th program
- Expand industry relationships and advance PSM partnerships (following up on the initiatives started by John Nishio)
- Encourage individual memberships among those associated with the PSM

This is a very exciting and challenging time for both the PSM and the NPSMA. In a relatively short time span in higher education, we have seen very impressive growth in the PSM movement toward the registration of the 300th PSM degree program very soon. There is momentum for significant change in STEM graduate education, that we are committed to continue. As a professional organization for the PSM, we have the unique opportunity to advocate for this unique hybrid degree that has been widely acknowledged as a change agent for higher education/business partnerships to promote economic and work force development. We also serve as a major provider of professional development and best practices for the PSM community.

Let us work together to continue to achieve even greater success for the Professional Science Master's in the years ahead.

New 2013 NPSMA Board of Directors Elected

We have a very committed and dedicated board in place for 2013.

President: David King, Professor of History and Dean, Graduate Studies & Research, State University of New York-Oswego

Vice President: Deborah Silver, Executive Director, Professional Science Master's Program, Rutgers, The State University of New Jersey

Convener: Inge Wefes, Associate Dean, Graduate School College of Medicine, University of Colorado, Denver

Finance Officer: Joaquin Carbonara, Professor of Mathematics, Buffalo State College

Immediate Past President: Bogdan Vernescu, Professor & Mathematics Department Head, Worcester Polytechnic Institute

Cynthia Bainton, Administrative Manager, Biotechnology Programs, Northeastern University

David Dyer, Director, Program for Applied Biotechnology Studies, California State University, Fullerton

Joan Huber, Program Coordinator, Department of Plant Biology, University of Illinois Urbana

Patricia Komuniecki, Vice Provost for Graduate Affairs & Dean of College of Graduate Studies, University of Toledo

Michael Morad, Quality Compliance Manager, Covidien Vascular Therapies

Donald Pierson, Vice Provost Graduate School of Education, University of Massachusetts, Lowell

Jean Schaake, Associate Dean of Academic Affairs, College of Arts & Sciences, University of North Texas

Sheila Thomas, California State University Dean Extended Education, Chancellor's Office

Marilyn Wells, System Liaison for Strategic Initiatives, Academic and Student Affairs, Pennsylvania State System of Higher Education

Peiru Wu, Associate Professor & Program Director, Department of Mathematics, Michigan State University

NPSMA Activities During the Second Half of 2012

By Bogdan Vernescu, Professor and Department Head, Mathematical Sciences, Worcester Polytechnic Institute; NPSMA Immediate Past President



The 15th anniversary of the PSM movement was achieved in 2012, and so was our association's 5th year of existence. In these five years we have strived to stay true to our motto of being "The Voice of the PSM Degree." The traditional means by which we have grown the NPSMA has been by providing support to new and developing programs. With a critical mass of PSM programs in certain disciplines, we have moved from organizing "regional best practices workshops" to facilitating more focused discipline-specific meetings; thus in 2012 we organized two workshops: *Preparing Graduates for Rewarding Careers in the Biotechnology Industry* in Tampa, FL, March 1-2, and *Green and Growing: Environmentally-Focused PSM programs* in Monterey Bay, CA, September 27-28.

We have continued to ensure individualized support for programs, providing access to the expertise of our members, visiting with faculty and administrators from universities and colleges planning to start PSMs, and taking part in the events organized by universities with established programs. In 2012 we took on two strategic initiatives, both focused on our students and graduates. First, we wanted to help our member programs better engage their students in specific activities that can enhance the cohort experience and connect them with their peers; this is how the idea of student chapters and alumni ambassador programs was born. Second, we wanted to expand the tracking of PSM graduates' and our stakeholders' demonstrable evidence of the impact of the PSMs and providing us with important national data and trends.

The National Conference took place in November, in Denver CO, and the NPSMA Board of Directors chose the topic: *Enhancing Global Workforce Competitiveness through PSMs*. Several of the talks and break-out sessions addressed how PSMs respond and adapt to the economic globalization, how they prepare students to be successful in a global economy, and how programs respond to a growing international student population.

The NPSMA has continued to collaborate and engage with various groups involved in the PSM movement, as they serve

to grow new developments. Of great significance is the system-wide and state-wide adoption of the PSMs which represents both a quantum leap and a positive trend in the PSM movement. Thus we continue to partner with the systems' group and sponsor their monthly calls. We also remain in contact with the new PSM Office at the KGI that now coordinates the affiliation of programs. The Board of Directors has continued to be the driving force of the association, with assistance from our NPSMA Coordinator Deb Warren-Hite; we have benefitted from the tremendous vision and valued advice of our Director for Strategic Planning and External Projects, Don Langenberg. In addition, we solicited the expertise of John Nishio, former PSM program coordinator and NPSMA Board of Directors member, to assist us in a part time capacity as Interim Director.

As we continue to grow, it is essential that all members be actively engaged in our association. As we know, changes in academia are neither fast nor easy and our mission is to provide support to all our programs as they work to establish themselves sustainably. It is also important to periodically meet and celebrate our accomplishments, share our experiences and, at the same time, plan for the future. We are dedicated to expanding NPSMA's national role as the principal supporter and promoter of PSM programs. This will empower us to build new collaborations with existing national organizations, gain more corporate involvement, and support a wide range of educational institutions.

We will expand our work with alumni by engaging them at the national level in our marketing and advocacy efforts. In addition to connecting alumni with one another, tracking PSM graduates will give us and our stakeholders clear evidence of the impact of the PSMs and provide us with important national data and trends. One step is to help universities develop viable alumni ambassador programs for their PSMs. We will work to nationally engage all of our stakeholders, existing and prospective: from industry, business, government and non-profit sectors, who are potential employers and other professional partners.

All academic institutions are invited to join these efforts to grow the PSM movement and for individual members to share in the responsibility of reaching the goals that will serve us all. We look forward to seeing everyone in November 2013 at our National Conference in Arlington VA, to again celebrate our achievements and plan for the future.

NPSMA 3rd National Conference Summary

By Bogdan Vernescu, Professor and Department Head, Mathematical Sciences, Worcester Polytechnic Institute; NPSMA Immediate Past President

The 3rd National Conference was held on November 7-9, 2012 in Denver, Colorado, under the theme of *Enhancing Global Workforce Competitiveness through PSMs*. The Conference



started with greetings from the NPSMA President, Bogdan Vernescu, who talked about the association's activities during 2012, followed by Steve Van

Nurden, President and Chief Executive Officer of the Fitzsimons Redevelopment Authority, who gave the local welcome and talked about the successful experience of combining educational activities with biomedical entrepreneurship and commercialization in the Colorado Life Sciences District.

Susan Sauer Sloan, Director of the GUIRR, at the National Academies of Science and also NPSMA Advisory Board Member, talked about *The Value of Cross-sector Collaboration*, emphasizing the need and ways for developing better collaborations between the College and University sector, the



Federal Government and the Private sector, as a way to develop a well trained workforce able to contribute to significant productivity growth and innovation.

Peter H. Henderson, Director, Board on Higher Education and Workforce (BHEW) and Study Director, Committee on Research Universities, National Research Council the National

Academies, spoke on the recent NRC Report of *Research Universities and the Future of America: Ten Breakthrough Actions Vital to Our Nation's Prosperity and Security*. Among the actions included in the report, the development of new PSM programs was seen as desirable, as *the national capacity for interdisciplinary, employer-focused programs is far higher than at present*, and as the PSMs are in alignment with both career

Stephen Barkanic, Senior Director of STEM Policy and Programs, the Business-Higher Education Forum (BHEF) gave a presentation on *The PSM as a Map for New Undergraduate Pathways*. He spoke about BHEF's regional and national strategies that engage business and higher education partners in innovative projects that align undergraduate programs with workforce needs.



Arlen Meyers, Professor in the Departments of Otolaryngology, Dentistry and Engineering at the University of Colorado presented an interesting case study of a global network. The Society of Physician Entrepreneurs (SoPE), a global biomedical and healthcare innovation network, of which he is Founding President and CEO, helps biomedical and healthcare entrepreneurs get their ideas, discoveries and inventions to market by providing them with education, connections to service providers and investors and offering value added products and services. He also presented the certificate program in Bioinnovation and Entrepreneurship at the University of Colorado,



collaboration between the medical campus and the business school. Another case study was offered by Marilyn Wells, System Liaison for Strategic Initiatives, Academic and Student Affairs Pennsylvania State System of Higher Education (PASSHE) in her presentation *Updating of Long-standing Science Curricula to PSM Programs to Compete in a Global Job Market*. The redesign of several M.S. programs and their transformation into PSMs has resulted in better-enrolled, more successful programs.

Daryl E. Chubin, Senior Advisor, American Association for the Advancement of Science (AAAS), put the PSMs in the perspective of the 21st century. While he outlined the multitude of

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2012 NPSMA Awards

Each year at its National Conference held in November, NPSMA presents awards to outstanding members of the PSM community. The 2012 award recipients were honored in Denver:

- Cynthia Bainton**, Northeastern University
- Saeed Foroudastan**, Middle Tennessee State University
- Michael Morad**, Covidien Vascular Therapies
- Sheila Tobias**, Author and Consultant

Nominations for awards are accepted throughout the year. For more information, go to <http://www.npsma.org/awards>.



Maintaining a Competitive Online PSM Program

By Rana Khan, Acting Chair, Dept. of Information Technology and Systems; Director, Biotechnology Program, Graduate School, University of Maryland University College

The University of Maryland University College (UMUC) has seven PSM programs: PSM in Biotechnology with specializations in biotechnology management, bioinformatics, and biosecurity/biodefense; PSM in Information Technology with specializations in information assurance, software engineering, telecommunications management and environmental management.

All the PSM programs at UMUC are offered completely online and utilize program enhancement strategies that are effective in the online environment. This brief article highlights three strategies that the PSM in Biotechnology with specializations in biotechnology management, bioinformatics, and biosecurity/biodefense is using to provide student support, hands-on experience and a clear connection between the degree programs and jobs.

Strategy 1: Student Support Service – Professional Mentoring Program

An e-mentoring program was launched in the fall of 2009. Every student in the Biotechnology program can apply for this selective program. The selected student is paired with a biotechnology professional who provides career and professional development advice to the student on a regular basis. The relationship lasts until the student graduates from the degree program. Program alumni serve as mentor assistants who act as a liaison between the mentor and the mentee. Since its inception, over 200 students have applied to the program and almost 75 have participated or are participating. Several of the program alumni have become mentors in the program.

Strategy 2: Hands-on-experience – Online Capstone Projects

To provide an “internship” experience in an online environment, we designed a highly structured capstone course, which integrates a project sponsored by the industry. Teams of students work on a semester long project with individual and group deliverables proposed by the client. The final deliverables are a report and a web-based presentation. In 2012 we completed a total of 22 projects with 17 companies located all over the continental US and Canada. This project has become a core feature of this PSM program. Students rate this as an invaluable experience and a source of professional enhancement.

Strategy 3: Program Relevancy – Mapping Courses to Jobs

To showcase the relevancy and currency of our programs’ content we have started a process of mapping courses to careers. Basically, we conduct research on the jobs that our graduates are eligible for and extract the skills and knowledge from them. We then map these to the content of our courses to identify how closely our curriculum is aligned with the workforce needs and what revisions are needed to improve this alignment. So far we have completed this process for PSM in Biotechnology with a specialization in bioinformatics and plan to do it for the remaining specializations. This mapping shows at a glance what skillset students learn and how it will translate into a job.

In conclusion, at a very reasonable cost the Biotechnology PSM program at UMUC has conceived and implemented three strategies that work synergistically to enhance our PSM programs by developing stronger and sustained ties with the employers.

PSM Plus Courses Go Online

By Don Pierson, Vice Provost for Graduate Education, University of Massachusetts Lowell; NPSMA Board Member

As Professional Science Master’s (PSM) programs grow across the country, we have an opportunity to increase student access to high quality, “Plus” courses that match student interests and needs for convenience. Based on industry advice, PSM programs have developed “Plus” courses to complement science core requirements with offerings that address certain competencies required to advance in the workforce, including professional communication skills, project management, leadership and innovation, business ethics, and principles of accounting and business practices.

PSM students face two sets of challenges with the current array of “Plus” courses. First, students need to fit these courses around fixed schedules of the science core courses and internships. Second, since many PSM programs are still in early start-up stages, enrollment is low and they need to enlist other departments, such as Management, English, and Philosophy to cross-list offerings for relevant course titles. Unfortunately, the cross-disciplinary courses were not designed with PSM students as the primary constituents; assignments and practical applications may lack compelling relevance.

At least two universities have developed several “Plus” courses online in order to provide pertinent offerings and scheduling flexibility to students. The University of Massachusetts offers three such courses each semester, spring, summer and fall: Professional Communication, Project Management, and Leadership for Scientists. Go to <http://www.uml/psm>. For more information, contact Donald.Pierson@uml.edu.

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National Conference Summary (continued from page 4)

reasons that make the PSM's a 21st century degree, or the right degree at the right time, he also pointed out the challenges lying ahead.



James Sterling, Vice President for Academic Affairs, Dean of Faculty talked about the *PSM Affiliation Process* that, starting with July 1, 2012, was transferred from the Council of Graduate Schools to the PSM Office at Keck Graduate Institute. Gay Page, Executive Director of the Colorado Federal

Executive Board, talked about the federal resources available for STEM graduates, internship programs, recent graduates' programs and Presidential Management Fellows programs as well as the resources available for those interested in federal employment.



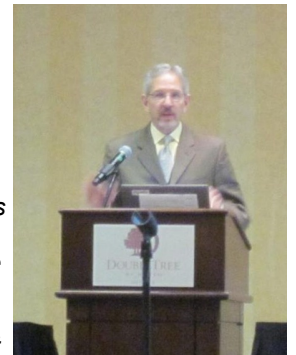
Reports on the two projects the NPSMA took on during 2012 were the topics of two plenary presentations. Sheila Tobias talked about her work on the alumni tracking project *Using Open Source Data to Advance PSMs* and David Jay and Michael Morad spoke about the pilot program *Creation of NPSMA Alumni Chapters*. While the first project is an in depth analysis of the career paths of PSM graduates, and provides a better understanding of the

value of the PSM degrees for the workforce, the second project wants to provide tools to help the program directors establish additional frameworks for maintaining the student/alumni connections.



Break-out sessions were dedicated to a wide variety of topics: International Educational Opportunities, Teaching Ethics with a Cross Sector Perspective, Challenges and Opportunities of Recruiting International Students, Preparing a Diversified Student Body to be Successful in Global Business Environments, Enhancing PSM Program Quality and Global Competitiveness through System-wide Collaboration on Professional Skills Courses; Teaching Intellectual Property Concepts for the Global Biotechnology Industry, Corporate and Academic Internships.

The 2012 National Conference was a success and reinforced the many achievements of the PSM community in these past 15 years, and those of the NPSMA in its five years of existence, while also pointing to the many future opportunities. I think there is no better way to end this summary than quoting from Daryl Chubin's remarks: *"What PSM has achieved is something that transcends boundaries and labels, that shifts the focus from degree alone to the skill set, from a single career path to a more variegated future from inherent constraint to boundless possibility."*



**National Conference on Undergraduate Research
University of Wisconsin - La Crosse
La Crosse, WI
April 11-13, 2013
<http://www.cur.org/>**

NPSMA Institution Member News

This newsletter serves as a venue for NPSMA institution members to make program announcements and attract national visibility. To receive full benefits and best practices advice for new programs, we encourage all non-member institutions to join the NPSMA.

News from the SUNY PSM Consortium

By David King, Director of SUNY PSM Consortium, Dean of Graduate Studies, Professor of History, State University of New York, Oswego; NPSMA President



The State University of New York (SUNY) PSM Consortium of 19 campuses met for their biannual meeting on November 26, 2012 at SUNY System Administration in Albany, NY. The meeting was chaired by SUNY PSM Director Dr. David King and convened over 30 representatives from each

of the participating SUNY campuses, as well as numerous leaders involved in the SUNY PSM initiative. Among presenters were SUNY Provost David Lavallee, National Professional Science Master's Association President Bogdan Vernescu, Senior Sloan Foundation PSM Representative Michael Teitelbaum, National PSM Advocate Sheila Tobias, and Keck Graduate Institute Vice President for Academic Affairs and PSM National Affiliation Director Jim Sterling.

Provost David Lavallee discussed the role of the PSM Consortium in advancing SUNY's goal to build partnerships between the university and New York businesses to advance economic and workforce development. Jim Sterling discussed the transition of the PSM affiliation process from the Council of Graduate Studies to the National PSM Office at the Keck Graduate Institute. NPSMA President Bogdan Vernescu spoke about the role of the association in providing services to the PSM community including professional development and national advocacy.

Sheila Tobias and colleague Dr. Susan Richards presented national PSM graduate employment data collected over the past year.

Also speaking at the conference was Sheila Cooley, Director of the Cooperative Education Program at SUNY Oswego. Sheila discussed the role of co-op experiences for PSM students, the merits of a co-op program in contrast to an internship, and how to effectively build relationships between campuses and industry partners. Co-op programs are distinct from internship programs in that they are generally longer placements and provide the student a much more hands-on experience at the firm where they are placed.



(L-R) Michael Teitelbaum, David Lavallee, Jim Sterling, Bogdan Vernescu

Other speakers included Nick Malchoff who discussed strategies for enhanced web pages and PSM promotion. Greg Ketcham spoke about the advantages of on-line curriculum delivery for PSM "Plus" courses, as a way of reaching broader audiences of prospective students.

Provost David Lavallee expressed the strong endorsement of SUNY leadership; including Chancellor Nancy Zimpher, for the work of the SUNY PSM Consortium.

PSM Plus Courses Online (continued from page 5)

Oregon State University currently offers seven courses in various semesters: Professional Skills, Advanced Scientific and Technical Writing, Communication and the Practice of Science, Research Ethics, Accounting and Finance for Scientists, Project Management & Marketing Scientific Technologies, and Innovation Management. Courses have been packaged as a Graduate Certificate Program option accessible to non-PSM students (<http://psm.science.oregonstate.edu/professional-training>). Go to <http://oregonpsm.org/educational-opportunities/courses> for additional course offerings, and for more information, contact barbara.taylor@oregonstate.edu.

National Directory of PSM Courses Online

I am interested in building a National Directory of PSM online courses supported by transfer agreements, to enable students the greatest access to high quality, flexible offerings. Don Langenberg, NPSMA Director of Strategic Planning and External Projects, has suggested that students beyond the PSM network would be interested in such opportunities.

To contribute to a PSM "Plus" Course Online Directory, or to explore this idea further, contact Donald_Pierson@uml.edu.

Rice University PSM Program Celebrates 10th Anniversary During School-wide Centennial Celebrations

By Dagmar Beck, Director, Professional Science and Engineering Master's Programs, Rice University



This year the Rice PSM Program celebrated its 10th anniversary! In 2002 we enrolled our first three PSM students, with one in our Nanoscale Physics track and two in our Environmental Analysis and Decision Making tracks! We celebrated the occasion as part of the campus wide Centennial Celebration in October 2012

with faculty, students, alumni and corporate representatives. The PSM program has experienced steady growth adding tracks in Subsurface Geoscience, Bioscience Research and Health Policy, and Space Studies in recent years. The newest program, Space Studies, is seeking to enroll its first group of students for Fall 2013! The Rice PSM program has gained the respect and support of industry, which again presented itself in the form of three large corporate scholarships received this January to support student stipends in 2013. Industry support continues to correlate with the solid employment records our PSM graduates achieve.

PSM Cross-Cultural Workshop

With the increasing number of international professional science master's students, the Rice PSM Office developed a workshop focused on the needs of international "professional" students to learn skills required of Western corporate culture. The workshop goals are to ready students to network, meet corporate representatives, attend career fairs and interview for internships. The workshop covered topics such as:

- USA Culture and Traits
- Social Interactions and Networking
- Moving from Networking to Interviewing
- Interviewing Skills and Mock Interview practice sessions

In addition, we prepared a "western culture" information package, sent to incoming students in June, to raise their awareness and provide English language materials to prepare them for writing their resumes, and practicing their English speaking and writing skills. The goal was to get them thinking early on about their career goals so upon arrival at Rice they would be better prepared to hit "the ground running" and compete with domestic graduate students.

E-Learning Pilot Project

In the Professional Science Master's program, we recognize the need to provide video resources to our students to make lectures easily available when they have to miss class due to business travel or other commitments. Therefore, the School of Natural Science has joined forces with the School of Engineering to move forward with an initiative to record several courses during the spring and fall semesters, aided by an on-line specialist familiar with the software and camera/microphone equipment to ensure a quality recording.

New Industry Projects Intensify Learning in Plant Biology PSM at University of Illinois at Urbana-Champaign

By Joan Huber, Program Coordinator, Illinois Plant Biology PSM; NPSMA Board Member

The Plant Biology PSM at Illinois has introduced a new prong of experiential learning into the on-campus semesters of its 15-month program to complement their summer internship and discretionary laboratory research experiences. The Plant Biology PSM students undertook their first Team Industry Project during the fall semester 2012. Working under the direction of Chromatin Inc., located in the Research Park at Illinois, PSM students, Miranda Morgan, Grant Hansen and Brandon Jordan, managed a semester-long research project that explored the feasibility of a proposed venture at Chromatin. The team was mentored by Dr. Otto Folkerts, Director,



Transgenic Programs at Chromatin, and advised by Plant Biology and College of Business faculty advisors throughout their work to address technical questions and economic factors. Using their knowledge of plant biotechnology, business fundamentals and internship experiences, the students constructed a working outline and modified it in stages throughout the semester to sharpen the focus on key aspects of particular relevance to Chromatin's strengths and objectives. The project culminated with a team presentation to a Chromatin audience comprised of both scientists and business representatives in strategic development and intellectual property. The Plant Biology PSM students ranked their industry project with Chromatin among the most valuable opportunities in the PSM program – and one with tangible outcomes with respect to gaining permanent employment.

The value of structured, intensive real-world team projects of mutual benefit to students and businesses is gaining traction among PSM programs. Case study projects in PSM programs were a featured discussion at the NPSMA workshop held in 2012 in Tampa, FL. Paul Hamilton, Director of the Microbial Biotech PSM at NCSU and a speaker at the workshop, has described the importance of student projects to program – and student – success*.

Hamilton, PT et al., 2012. Preparing Science-Trained Professionals for the Biotechnology Industry: A Ten-Year perspective on a Professional Science Master's Program. JMBE 13:39-44.

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University of Wisconsin-Stout PSM Program in Conservation Biology

By Kitrina Carlson, Director, Sustainability Sciences Institute, Associate Professor of Biology

The University of Wisconsin-Stout College of Science, Technology, Engineering and Math (STEM) is planning a new Professional Science Master's (PSM) Degree in Conservation Biology for fall 2013. The proposed major will include three tracks: Aquatic Biology, Molecular Ecology, and Applied Plant Science. This new degree is structured to provide students with high-quality training in evaluating, understanding, and providing solutions to society's conservation challenges. The program will emphasize skill development that is relevant to industry and agency needs in conservation biology. All students in the Conservation Biology PSM program will be part of a closely mentored experience they can tailor to their own professional needs and students will be advised into one of three tracks based on their professional goals:

Aquatic Biology

Students in the aquatic biology track will develop a deep understanding of aquatic systems and the need for sustainable approaches in their exploitation. Specific foci of the aquatic biology track include the development of skills and knowledge in the assessment and rehabilitation of eutrophication- and pollution-related water quality problems, and the development of skills and knowledge in the assessment and sustainable management of aquatic resources, such as fisheries.

Molecular Ecology

Students in the molecular ecology track will bridge the gap between the laboratory and natural populations. More specifically, they will employ molecular genetic markers to address questions of extant population structure, mating system dynamics, migration, molecular systematics, and recent and historical demography. They will conduct this work in the context of conservation and will have internship opportunities with state, federal, and private agencies, including zoological parks and conservatories.

Plant Biology

Students in the plant biology track will develop skills and knowledge in advanced horticultural technique, plant breeding and biotechnology, all in the context of conservation. The program will emphasize ways to mitigate threats to plant diversity, considering agronomic needs as well as global approaches to halt the loss of plant species diversity. Students will have the opportunity to participate in internships ranging from multi-national plant research facilities to regional farms and businesses based on their own professional interests.

There are no similar PSM degrees in the region, and the breadth of the proposed program and focus on sustainable industry needs sets the conservation biology PSM at UW-Stout apart from traditional conservation or environmental science MS degrees in the area.

Michigan State University PSM Program in Industrial Mathematics

By Peiru Wu, Director of PSM in Industrial Mathematics Program, Michigan State University; NPSMA Board Member

Last September our annual Welcome Dinner was held in a local restaurant in Okemos, Michigan to welcome new students joining the PSM in Industrial Mathematics Program at Michigan State University [see the picture below]. The program continues



to flourish as a successful model to produce generalized problem solvers of great versatility, capable of moving within an organization, from task to task at industrial positions in their career paths. Six students will be graduating in summer 2013.

One of main successes of our program is the strong connections with numerous companies in Michigan for over thirteen years. This includes two major components: active industrial advisory board and spring industrial projects sponsorship every year which have been playing a bridge developing and establishing relationships between the program and local industries in various ways.

Last October, we made a field trip to visit the Chrysler Technology Center, Auburn Hills, Michigan for a job shadow. This is the first time for the entire program to go to the industrial site with the special arrangements by our industrial advisor. We fully enjoyed the warm morning reception from the host and the presentations by various employees in the Powertrain Virtual Analysis department, as well as afternoon tours of several departments. It is impressive for everyone to see so much detail and effort at engineers' work: "This was fascinating because it shows how much attention their engineers focus on details. Every aspect of an automobile gets tested and changed in order to provide their customers with the best product possible." "It is hard to imagine how much effort the scientists and engineers spent to create them. That was a good illustration of how a theory is directly applied into industry." "It was also intriguing to view the extreme various scenarios the emissions labs must experiment with to ensure the vehicles comply with government regulations." The most interesting thing for industrial math students is to see how to apply the knowledge and training from MSU in the real world such as auto industries.

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The Pennsylvania State System of Higher Education's (PASSHE's) Professional Science Master's (PSM) Initiative: Five Years of Capacity Building Leading to Milestone Achievements in 2012

By Marilyn J. Wells, NPSMA Board Member, PASSHE Office of the Chancellor; James D. Moran III, PASSHE Office of the Chancellor; Qiana A. Lightner, PASSHE Office of the Chancellor

The year 2012 marked milestone achievements for the Pennsylvania State System of Higher Education's (PASSHE's) Professional Science Master's (PSM) Initiative. These achievements were made possible by capacity-building developments over the past five years and with strong support of multiple leaders, at the system and university levels. To provide context, PASSHE is comprised of 14 universities, situated in communities across the Commonwealth: Bloomsburg, California, Cheyney (a HBCU), Clarion, East Stroudsburg, Edinboro, Indiana, Kutztown, Lock Haven, Mansfield, Millersville, Shippensburg, Slippery Rock and West Chester, with the Office of the Chancellor, in Harrisburg, Pennsylvania. PASSHE is the largest provider of higher education in the Commonwealth serving around 115,000 students with more than 120 degree programs (associates through doctoral).



Five years of capacity building began in 2008 with PASSHE joining the national PSM movement, under the leadership of two PASSHE university presidents, Presidents Cevallos (Kutztown University) and Dillman (East Stroudsburg University) and with the support of the National Association of System Heads (NASH), the Council of Graduate Schools (CGS), the NPSMA, and The Alfred P. Sloan Foundation. This launched momentum, policy change, and resources for capacity building to meet workforce demand in high-technology sectors in the Commonwealth.

In 2009, a System-wide PSM conference was held and NPSMA representatives were invited to speak to interested faculty and administrators. In 2010, the Board of Governor's approved the PSM as a new degree designation, and PASSHE received a grant from the Sloan Foundation.

With external funding from the Sloan Foundation, PASSHE established a *PSM Workgroup* and engaged 11 of the 14 PASSHE universities, leading to milestone achievements in 2012:

- Five new or re-organized science master's programs with national PSM affiliation with an additional four program tracks under review to meet the NPSMA standards
- Ten universities and the Office of the Chancellor joined NPSMA, nine with two-year memberships
- Over 40 online "professional skills" courses across PASSHE universities
- Over 50 STEM employers confirmed, invited, or identified to serve on university/regional PSM employer advisory boards
- First graduate of a PSM program (Kutztown University)

Collectively, these achievements have established new opportunities in graduate education and heightened PASSHE's role in STEM in the Commonwealth, and advanced PASSHE as a leader in the national PSM movement. In June 2012, PASSHE was invited to coordinate the national PSM Systems Network; and in December 2012, Dr. Marilyn Wells, (East Stroudsburg University) was elected to NPSMA's Board of Directors.

Goals for *PASSHE's PSM Initiative* in 2013 are to: (1) continue to collaborate with the PASSHE Foundation to build a *PASSHE Science Initiatives Advisory Board* to broaden and deepen support, (2) plan for sustainability of the *PASSHE PSM Workgroup* to guide future directions, and (3) increase communications about PASSHE's PSM Initiative to multiple audiences, including prospective students, business and industry, legislators, and the public.

Michigan State University (continued from page 9)

"The presentations at the beginning really showed how math can be beneficial even in a non-mathematical field." "We were able to hear from people in different departments and see how different topics of mathematics pop up in these different departments." "I enjoyed seeing how other sciences were involved with the car manufacturing and testing process."

Students' feedback is evident that they actually learned more than they imagined from a job shadow trip: "Being on a tour like this gives you an insight to a company that you can't get just from researching on the internet or by talking to one employee. It's a whole other experience to actually walk through the building and see the company from the inside." This trip provided students a useful guide for how to better meet the industrial standard in their career path.

Biology PSM at University of Illinois (continued from page 8)

In the midst of growing support for enhanced experiential learning in PSMs beyond the summer internship, the Illinois Plant Biology PSM plans to developmentally incorporate industry projects into each semester, capitalizing on the synergism of on-campus team meetings that allow students to more readily build relationships and to foster their growing knowledge and competence in science, business, leadership and project management.

[Email Joan Huber](mailto:Joan.Huber@illinois.edu) for more about the Illinois Plant Biology PSM industry projects. If you are interested in discussions about enhancing experiential learning in PSMs: www.life.illinois.edu/plantbio/psm.

Recommend a Speaker

NPSMA will host a **Cybersecurity workshop on November 13, 2013** in Arlington, Virginia, preceding the NPSMA National Conference on November 14 -15. Speaker recommendations are welcome and members are needed to join the committee. Email admin@npsma.org.

NPSMA is Supporting Tracking Grads During 2012-2013

By Sheila Tobias, Author and Consultant, NPSMA National Advisory Board Member

In 2011, as part of the NASH-PSM system-wide expansion, Sheila Tobias, long-time PSM advocate, and Susan Richards, began tracking PSM graduates from 20 of the longest-standing PSM locations (2-3 programs in each), employing a new source, namely *social media*. Requiring only four items of information from program directors: year of graduation, PSM program name, and University location, they were able to access PSM graduates' own uploaded information (resumes, posts) including their current employment (in some cases past employment), and current job title.

Of particular interest to NASH (National Association of System Heads) members was *where* PSM graduates are working, namely did they remain in the state where they got their degree? in which case, the campus president or system head could document a measurable work force enhancement which translated into a high "return on investment" to state authorities.

Tobias presented their method, their findings, and the manner in which their searches were proceeding at two NPSMA Regional Workshops (Buffalo 2011 and Monterey 2012), at the MidWest Graduate Deans Meeting (MAGS, 2012) in Chicago, and at the NPSMA National Conference in Denver, last November. Their method was sufficiently cutting-edge to make it to The Chronicle of Higher Education in June 2012. [Click here](#) to read article.

They are currently updating their records with names/ graduation dates of programs' 2011 and 2012 graduates. If yours is one of the 20 universities, you will be hearing from them this winter.

NPSMA is providing support for continuing what Tobias and Richards call their "Probe": first a return to the 20 universities for their 2011 and 2012 PSM graduates; second, the fresh analysis of any NPSMA member institutions which apply to have their PSM graduates tracked. If you are a member institution and have not yet been contact, please email sheilat@sheilatobias.com.

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